

■ **LIQUID STUDY NO 3** ■

for cello and electronic sound

◆

2 0 2 1

"There is no such thing as repetition.
Only insistence." - Gertrude Stein

for Jonathan Aasgaard

■ **BENJAMIN HACKBARTH** ■

PERFORMING THIS PIECE

To browse materials related to performing this piece, visit <http://www.benhackbarth.com/ls3/materials>

This is an A4 performance part. A cello part made for the iPad's 4:3 screen size is available [here](#).

ELECTRONICS

Electronic sounds are generated in realtime to follow the timing of the players actions for almost the entire duration of the piece. These processes are controlled either by the cellist using a foot pedal, or having an electronic assistant press the spacebar. In either case, coordination is achieved through triggering the computer program using the cues notated on top of the staff in square boxes.

However, there are two sections that are not realtime – between cue 1 and cue 2, and from cue 43 to the end. Here the player must listen to the electronics and follow the given tempo. The electronic materials of these sections consist of repeating, easily-followable rhythms that will orient the performer.

Regardless of whether or not an assistant is used to trigger the cues, an assistant is required to run the mixer during the performance to control the amplification of the instrument and the overall mix. A special version of the score is available for the assistant, which includes notes about changing levels of amplification and electroacoustic integration throughout the piece.

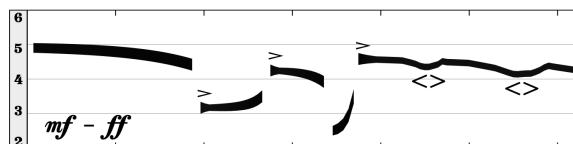
PROPORTIONAL NOTATION

Liquid Study 3 includes a large section of music which is notated proportionally.

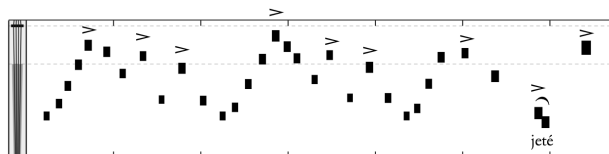
The temporality of proportional notation remains constant throughout: each system lasts 10 seconds, and each vertical tick equals one second (one beat at a tempo of 60). In addition to specifying time, the graphical notation system describes pitch and dynamics. The size of noteheads/sustain bars indicates the volume of the event produced. Conventional written dynamics often supplement this notation for clarity.

Each system of proportional notation includes a “clef” at the start of the system. There are two types of clefs used in this piece:

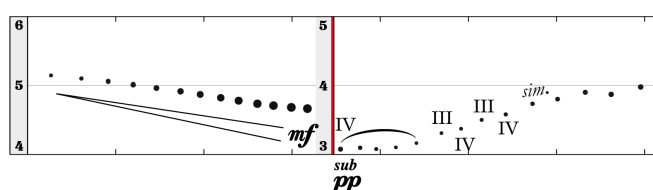
The “interval clef” shows pitch from low to high. It is always written to span two or more octaves where the top and bottom lines always correspond to ‘C’s. These are labelled numerically inside of the clef on the left. There will always be a solid line inside pitch space to show any other ‘Cs’. In the example below, the bottom line is C2, the top is C6, and horizontal lines denote all of the Cs in between.



The "fingerboard position clef" shows the cello strings upside down. The two horizontal dashed lines on each system show the position of the bridge and the end of the fingerboard. The bottom of the staff corresponds to the position on the fingerboard to create the interval of an octave.



Sometimes, the clef changes midway through the system. Anytime a clef changes, it is made more visually apparent with a red line. The example below shows one such clef change, where halfway through pitch shifts down one octave:



PERFORMANCE NOTES

Circled numbers positioned at the bottom of the staff refer to performer to the following notes:

- ① A deep, rich, pitchless sound. Sempre bow near bridge with complete L.H. muting. All dynamics are relative to the possibilities of the performance technique. The portato on the downbeat of each measure in this section should be performed without bow change. Accents are dramatic throughout.
- ② Still pitchless, but now a thin, very high in frequency. L.H. finger position is about 3cm away from the bridge.
- ⑤ The sound remains the same from the previous section, always upbow staccatissimo. Initially, high notes are often written on low strings to get a more percussive, unfocussed sound.
- ⑧ Grittier, menacing. After 6 seconds, the speed of scratch decreases, gradually breaking apart into individual grains of sound (notated to give a sense of approximate temporarily)
- ⑨ Unpitched, like the opening, except on E4 with a very small amount of pitch. light, fast bow gliding across the string with minimal pressure.
- ⑩ The ending of the piece is entirely in tempo, and this tempo is given by the electronics in the form of a repeating 2-bar phrase of music. Initially these phrases are articulated with thick textures of sounds but, gradually, the rhythm becomes more pointillistic. However, the underlying rhythm remains the same until the end.

♩ = 108 solo (no electronics), heavily amplified, *mechanical*

III
IV

0

(portato)

① *mf* *mp* *mf* *mp* *sim.*

legato

② *mfp* *mfp* *mfp* *mfp* *mfp*

III
IV

mfp *mf* *mf* *mp* *mf* *mp* *sim.*

I
15^{ma} ord ST

mfp light trem *mfp* *mfp* *mfp*

ST

III
IV ord

mf *mp* *mf* *mp* *sim.*

mf > *mp* *mf* > *mp* *mf* > *mp* *mf* > *mp* *sim.*

(rebow as needed)

1 electronic entrance

f

electronics in time; each downbeat is articulated and audible

2

I 15^{ma} st ord

sim.

8

mp softer, lighter than before

5

5

5

3

mf > *mp* *f*

mf > *mp* *f* *mf* > *mp* *f* *sim.*

5

5

5

5

5

4

I 15^{ma} ST

sim.

3_{sub} *mf* > 3_{sub} *mf* > 3_{sub} *mf* > 3_{sub} *mf* >

5

ST ord

mf > III IV *f* > *f* *mp* *mf* > *f* > *f* *mp* *mf* >

(rebow as needed)

f > *f* *mp* *mf* > *f* > *f* *mp* *mf* >

6 *ord* *15^{ma}* *ST* *sim.*

fp *<f>* *<mf>* *fp* *<f>* *<mf>* *sim.*

7

f *>* *mp* *f*
(rebow as needed)

8

f *>* *f* *>* *f* *>* *f* *>* *f* *>*

9

sim. *f*

5+ seconds

solo (no electronics)
amplification reduced
sempre upbow staccatissimo
sul III

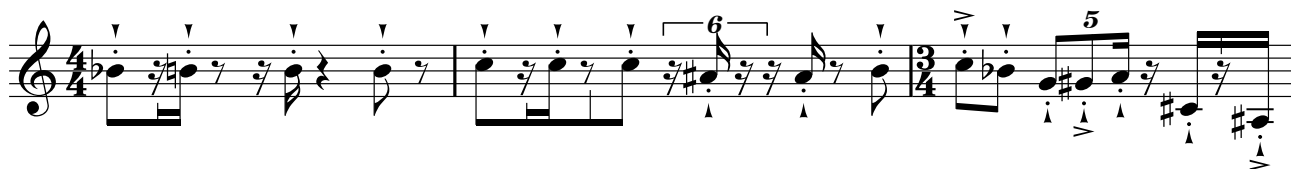
fp *ff* *p* *pp*
electronic peak
slur = jeté

any strings

sul III

p *pp*

p *pp*



6
5
4

*come sopra
sul III*

identical to the double bar

jeté ⑤

p *pp*

10 electronic entrance

p

6
5
4

sul II

sul I

pp

11

6
5
4

p

p

6
5
4
3

p

12

5
4
3

II II III

sub
mp *pp*

5
4
3

II III II

sempre alternate III and II

6
5
4

sul I

sul II

p

mp

13

18

sul II

L.H. position

mf > mp

mf

mf

19

II

mf

III

sul II

fmf

mf

sim.

20

cresc poco à poco

f

C.L. Battuto "heavy bouncing bow"

mf - f

21

arco

I

II

I

f mf < f >

L.H. f.b. slap

22

C.L. Battuto "heavy bouncing bow"

f

mf - ff

23

arco

sul II

f > mf

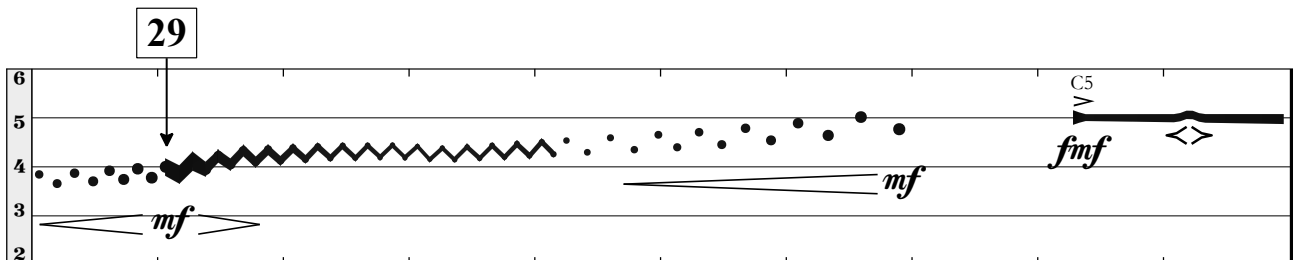
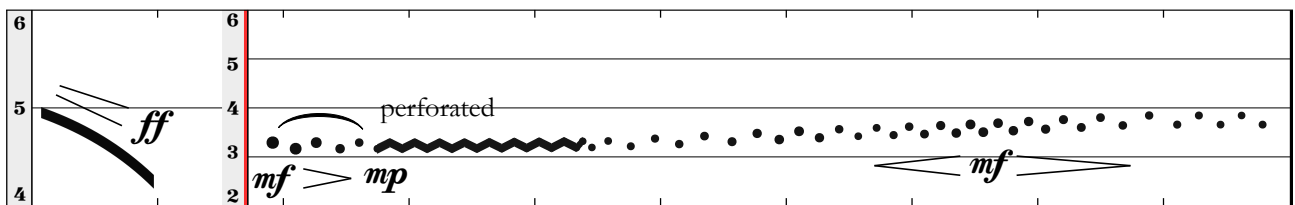
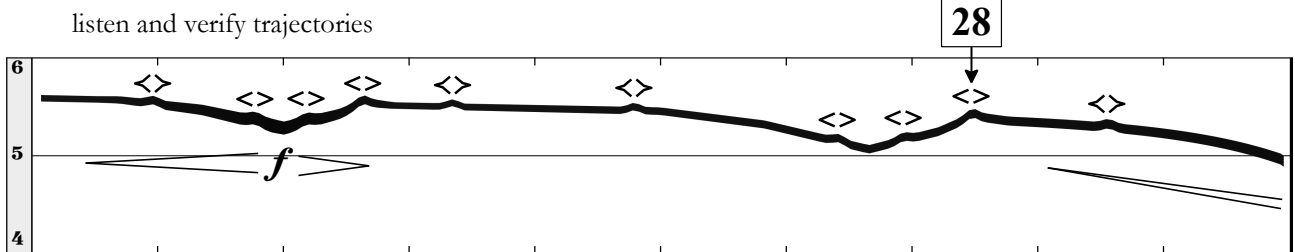
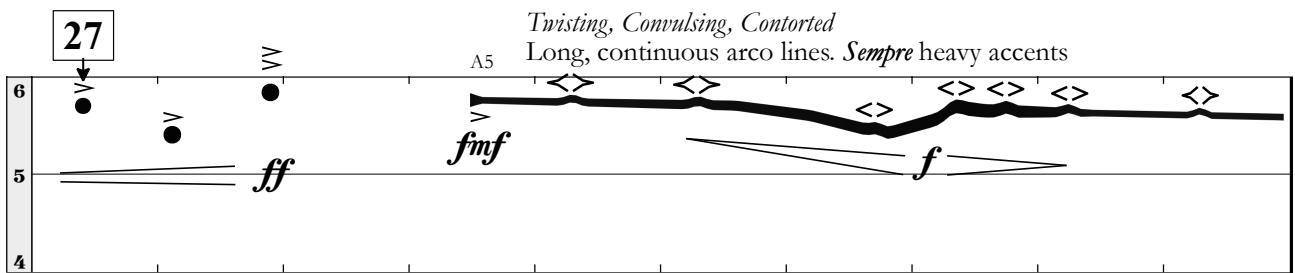
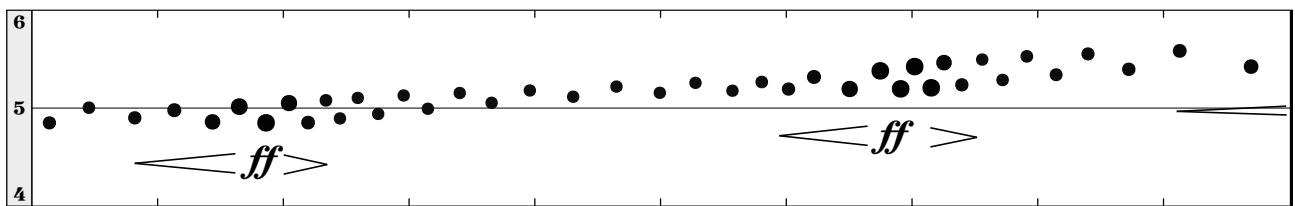
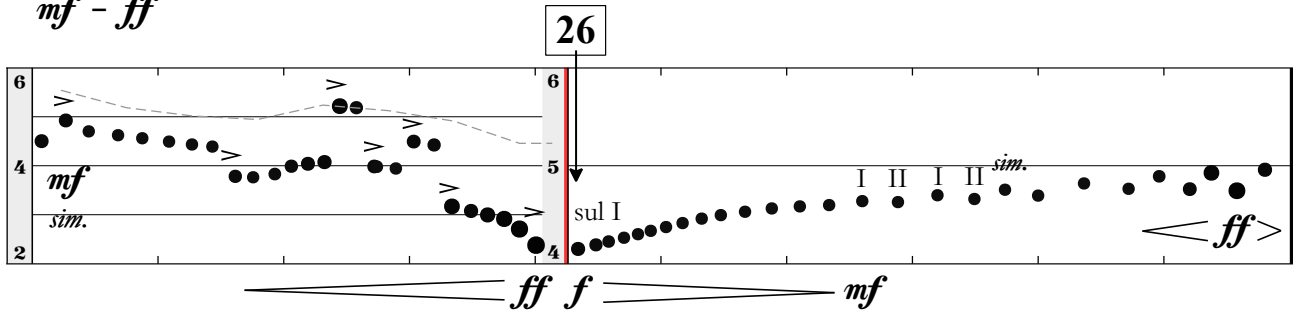
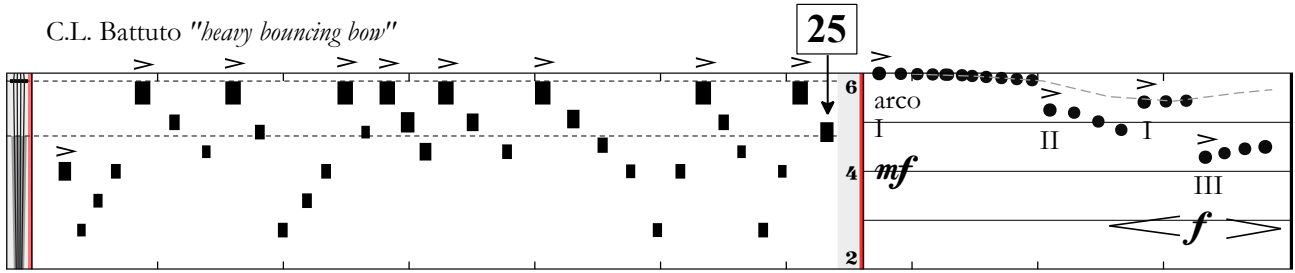
jeté

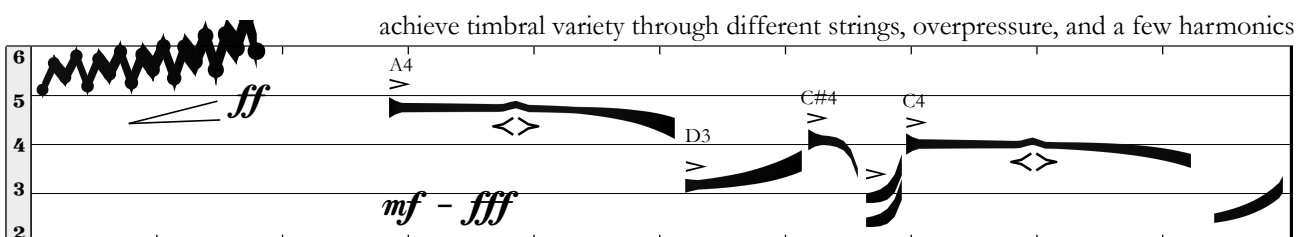
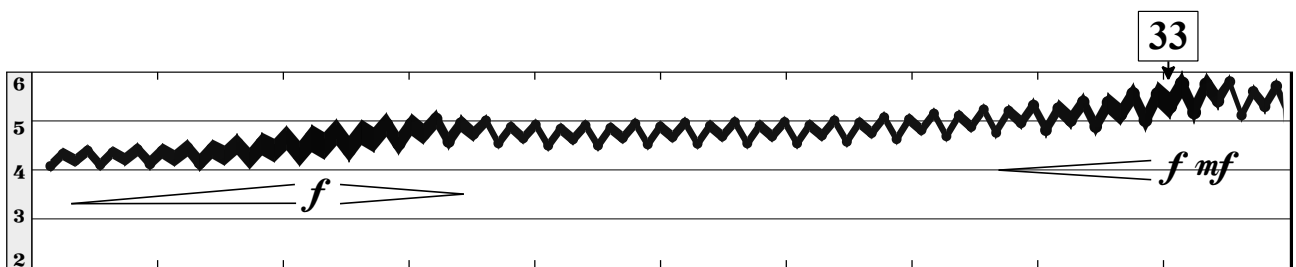
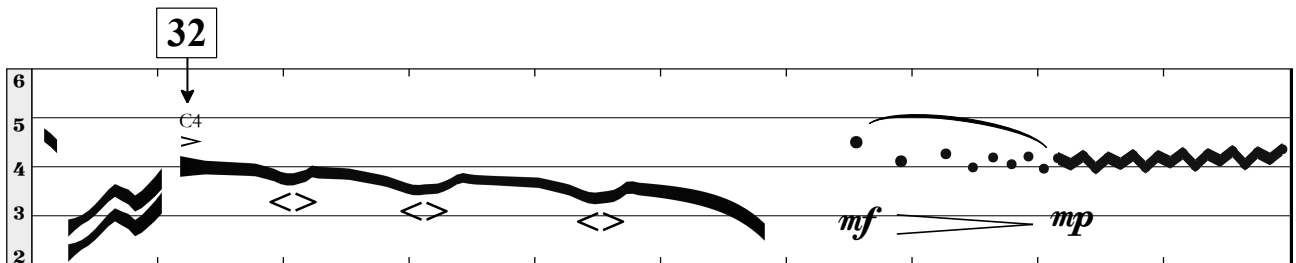
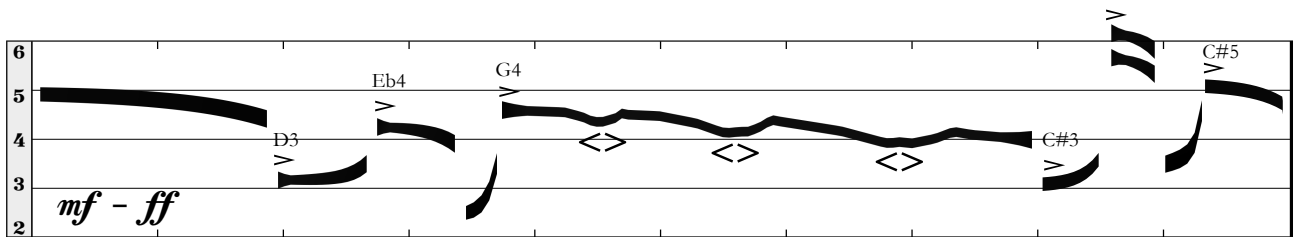
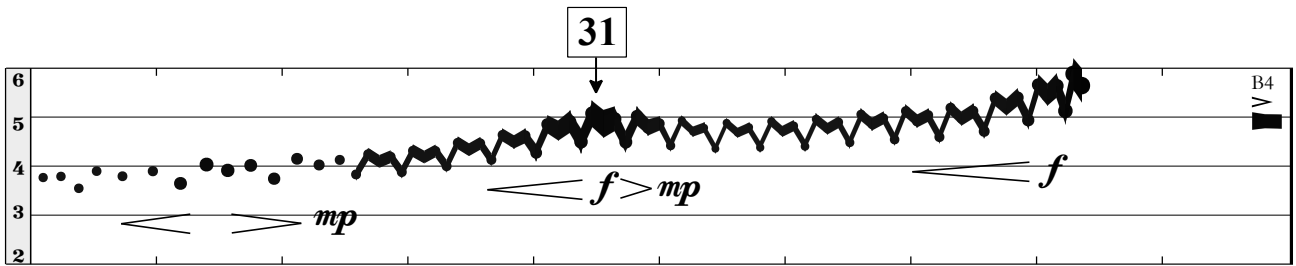
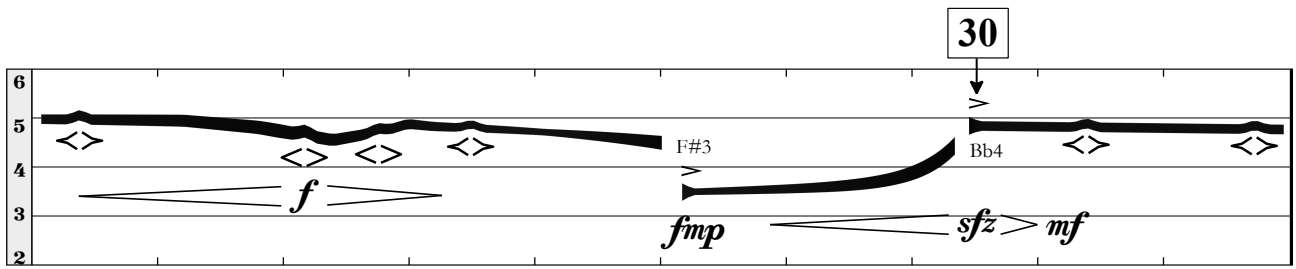
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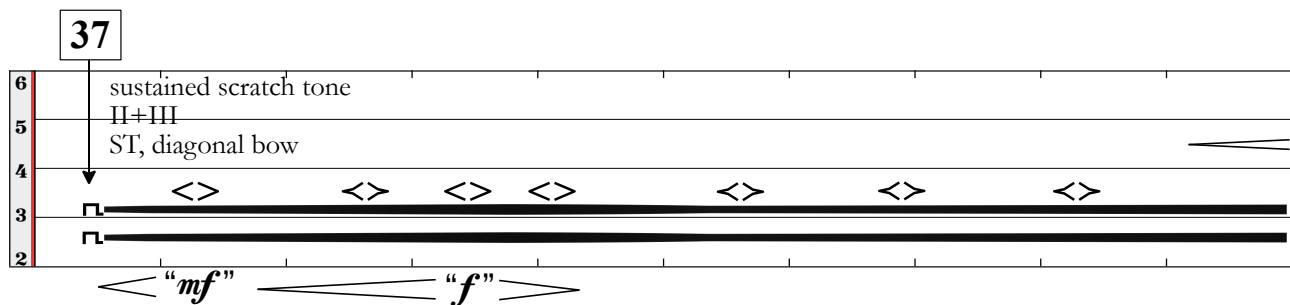
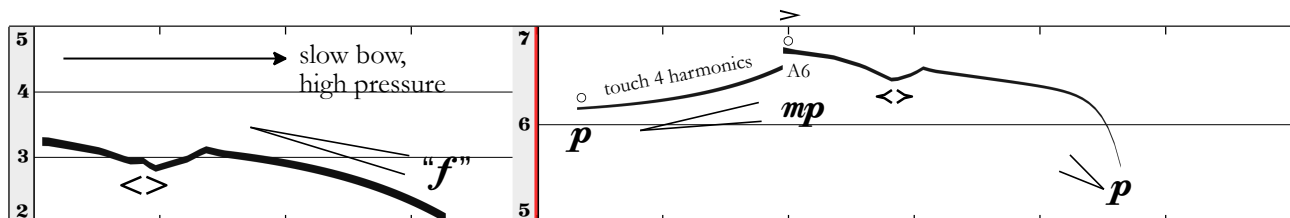
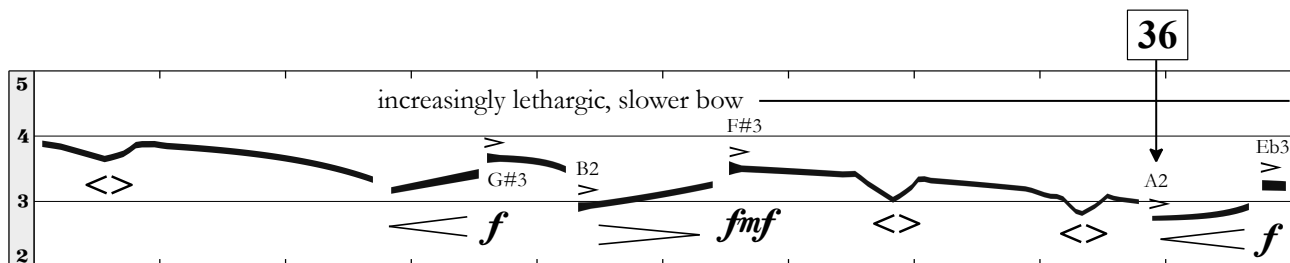
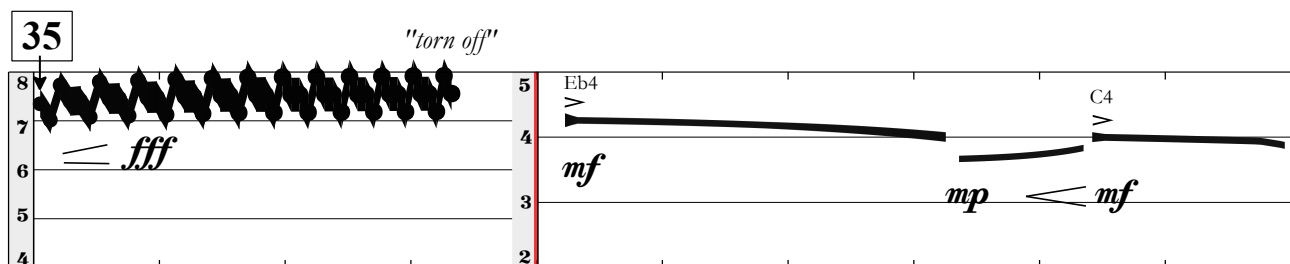
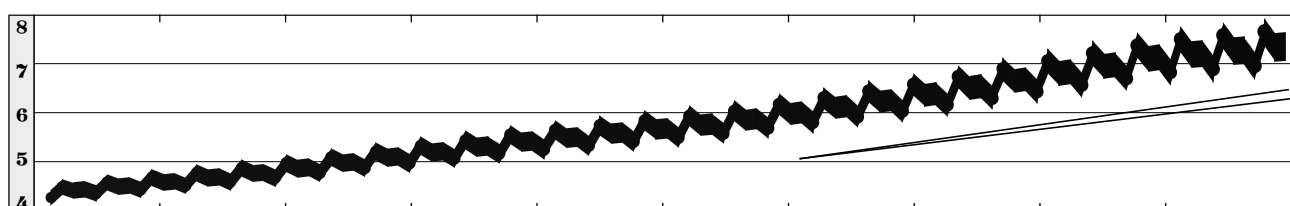
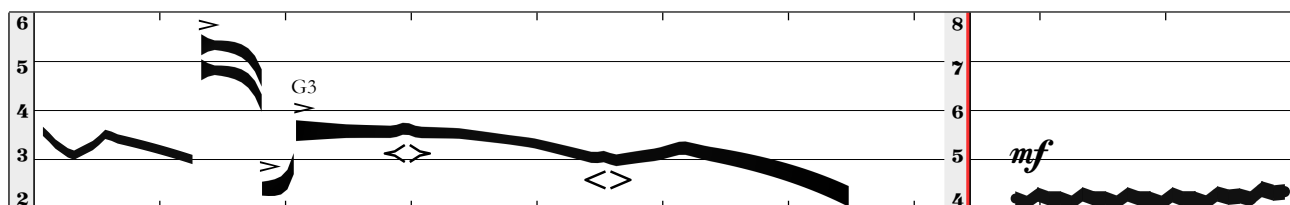
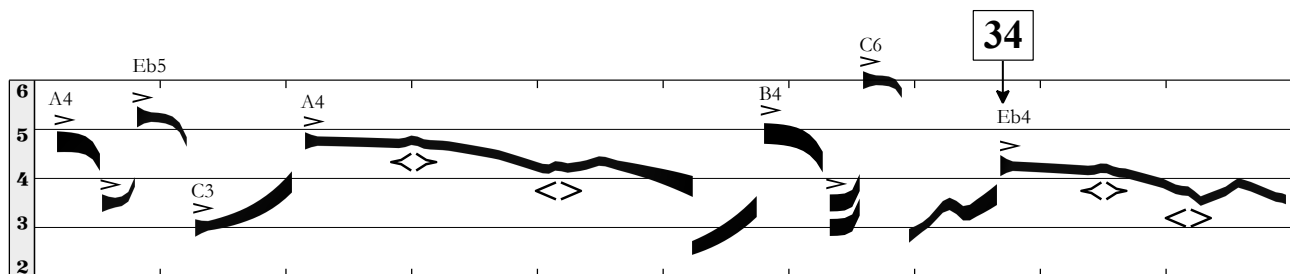
f

f > mf

f







38

f

IV ST

grittier, more guttural, menacing

8

dim poco à poco

individual grain

10+ seconds

39

mp

IV ST

grittier, more guttural, menacing

8

10+ seconds

40

mp

IV ST

grittier, more guttural, menacing

8

41

mf

IV ST

grittier, more guttural, menacing

8

42

mf sub. p

3/4

$\text{♩} = 74$

43

come sopra

ST

SP

44 (final cue)

ST

SP

f

visually dramatic

sub. p

10

brex it means brex it

ST

gradually change timbre
gradually less accented

3

5

mp

brex it means brex it means

ordinario pitch
vibrato espressivo

p

mp

brex it means brex it

warm timbre
subito senza vib.
sempre legato

First system of a musical score. It consists of two staves. The upper staff has a treble clef and contains a melody with eighth and sixteenth notes, featuring triplets and quintuplets. The lower staff has a treble clef and contains a bass line with eighth notes and rests. The lyrics "brex it" and "means" are written below the bass line. A dynamic marking *p* is present at the beginning.

Second system of the musical score. It continues the melody and bass line from the first system. The lyrics "brex it" and "means" are repeated. The system includes various musical notations such as slurs, ties, and articulation marks.

Third system of the musical score. The melody in the upper staff continues with more complex rhythmic patterns. The bass line in the lower staff remains consistent with the previous systems. The lyrics "brex it" and "means" are repeated.

Fourth system of the musical score. This system concludes the piece with a final cadence. The melody and bass line are clearly defined, and the lyrics "brex it" and "means" are repeated for the last time.

First system of a musical score. It consists of two staves. The upper staff is in treble clef and contains a melodic line with a slur over the first three measures and a *pp* dynamic marking in the third measure. The lower staff is in bass clef with a key signature of one sharp (F#) and contains a bass line with lyrics: "brex it", "brex it means", "brex it", and "brex it means". The bass line features triplet markings over the first and third measures.

Second system of the musical score, continuing the two-staff structure. The upper staff continues the melodic line with a slur. The lower staff continues the bass line with the same lyrics: "brex it", "brex it means", "brex it", and "brex it means". Triplet markings are present in the first and third measures of the bass line.

Third system of the musical score. The upper staff continues the melodic line, ending with a fermata in the final measure. The lower staff continues the bass line with lyrics: "brex it", "brex it means", and "brex it". Triplet markings are present in the first and third measures. The system concludes with a double bar line.

electronic rhythm dialates